



Agriculture
Canada

Publication 1881/E



Insects infesting seed alfalfa in the Prairie Provinces

a field guide



Cover photo

Lacewing larva eating an aphid

Printed with the financial support of the following:

Alberta Alfalfa Seed Producers Association
Saskatchewan Alfalfa Seed Producers
Association
Manitoba Forage Seed Association
Alberta Agriculture

Insects infesting seed alfalfa in the Prairie Provinces

a field guide

B.D. Schaber

Research Station
Lethbridge, Alberta

Agriculture Canada Publication 1881/E

available from

Communications Branch, Agriculture Canada
Ottawa, Ont. K1A 0C7

© Minister of Supply and Services Canada 1992

Cat. No. A43-1881/1992E ISBN 0-662-19588-4

Printed 1992 3.7M-06:92

Produced by Research Program Service

Également disponible en français sous le titre
*Guide d'identification des insectes qui s'attaquent à
la luzerne de semence dans les provinces des
Prairies*

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Integrated pest management

A program of integrated pest management has been established for seed alfalfa, which combines biological, chemical, and cultural control methods with management practices. This program is effective in reducing pest insect populations and increasing seed yield without harming beneficial insects and pollinators.

Economic thresholds are used as guidelines in making decisions to spray insecticides. They differ between irrigated and nonirrigated crops and with crop stage. A crop that is healthy and not stressed can support a larger pest insect population than a drought-stressed or malnourished crop. If a pest insect population reaches economic thresholds, contact your provincial agricultural field office or information on control. Consult provincial recommendations for timing and insecticide use specific for your area.

Sampling alfalfa fields

The success of a pest management program depends on regular sampling. For the most consistent sampling, one person should sample the same field, at the same time each week, throughout the entire season.

Set one sample site every 2.5 ha, with a minimum of three and a maximum of 10 sample sites per field. At each site take a set of five sweeps and record the insect count. Determine numbers per sweep by dividing the total count by 5. Compare the number of insects per sweep with the economic threshold. When numbers are close to the economic threshold and time permits, sample

again 2 or 3 days later. Cloudy, cool, and windy conditions will drive lygus and alfalfa plant bugs down from the upper crop canopy. If these conditions exist on your sampling day, be sure to resample that field as soon as good weather returns.

In Alberta, economic thresholds are based on the average number of insects captures in five 90° sweeps (Fig. 1). In Saskatchewan and Manitoba thresholds are based on five 180° sweeps.

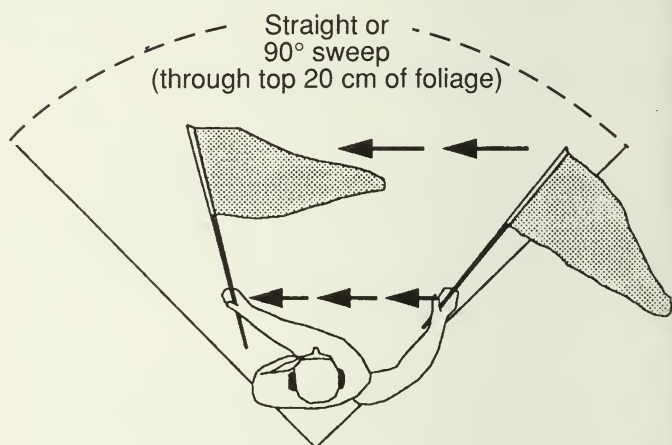


Fig. 1 Sweep diagram.

Pest insects

Alfalfa plant bug

Nymph

- up to 9 mm in length
- no spots on back
- nymphs 1, 2, 3 orange-green, no wing pads
- nymphs 4, 5 green with wing pads
- no cornicles, unlike aphids
- antennae thick and dark at tips.

Adult

- 8–10 mm in length
- yellowish green
- body, antennae, and legs long and thin.

Damage (nymphs 4, 5 and adults)

- feed on buds and flowers
- inject toxin.

Evidence

- bud blasting (buds turn white)
- bud and flower drop
- no bloom
- seeds brown to black and paper thin.

Generations

- one or two per year depending on climate.

Economic thresholds

Alberta

- nymphs 1, 2, 3 cause no economic damage
- nymphs 4, 5 at two to three per 90° sweep
- adults at two to three per 90° sweep.

Saskatchewan and Manitoba

- nymphs 4, 5 and adults at four per 180° sweep.

Control

- burn alfalfa stubble in spring
- treat with insecticide at economic threshold.

Alfalfa plant bug



a, nymph 3; **b**, nymph 5; and **c**, adult; **d**, bud blasting caused by late nymphs and adults feeding

Alfalfa weevil



a



b



c

a, instars 2 and 4; and **b**, adult
c, shot holes caused by adults feeding

Alfalfa weevil

Larva

- up to 8 mm in length
- head capsule black
- instars 1, 2 light brown to brown
- instars 3, 4 green with white line down middle of back (contrast with syrphid fly larva, page 25)
- caterpillarlike (actually legless).

Adult

- 3–5 mm in length
- spring adults dark gray to black
- summer adults dark brown with conspicuous dark stripe extending three-quarters way down middle of back.

Damage

- feed on developing buds and leaves
- stunt growth.

Evidence

- skeletonizing (“shot holes”) in leaves
- field has silvery sheen
- no bloom.

Generations

- one per year.

Economic threshold

Alberta (third- and fourth-instar)

- 20–25 larvae per 90° sweep.

Saskatchewan (third- and fourth-instar)

- 20–30 larvae per 180° sweep, or
- 35–50% of foliage tips exhibit feeding.

Manitoba Not found.

Control

- treat with insecticide after third instar appears and economic threshold is reached.

Grasshoppers

Nymphs and adults

- size varies from small to over 5 cm
- color varies from black, brown, or gray mixed with yellow or red
- nymphs similar to adults except smaller and wingless.

Damage

- feed voraciously on alfalfa, especially in seedling stands and after cereals and weeds have ripened
- feed on entire plant.

Evidence

- large areas of leaves missing
- racemes lying on ground.

Generations

- one or two per year.

Economic threshold

- more than 12 grasshoppers per square metre.

Control

- apply insecticide to borders if near prairie grass or uncultivated areas
- treat just after egg hatch; repeat applications as necessary.

Grasshoppers



clearwinged grasshopper adult,
Camnula pellucida (Scudder)



two-striped grasshopper adult,
Melanoplus bivittatus (Say)

Lygus bugs



a, nymph 3; *b*, nymph 5; and *c*, green and brown adults

Lygus bugs

Nymphs

- light green with black spots on back
- nymphs 1, 2, 3 with no wing pads
- nymphs 4, 5 with wing pads
- no cornicles, unlike aphids.

Adults

- up to 8 mm in length
- brown lygus: pale yellow to brown with dark brown, black, or red markings
- green lygus: pale green, some parts bright green
- distinctive "V" mark on the back
- body short and broad (contrast with plant bug).

Damage

- feed on buds, flowers, and pods
- suck juice out of developing seeds
- inject toxin.

Evidence

- bud blasting (buds turn white)
- buds and flowers drop
- no bloom
- seeds brown, wrinkled, and paper thin.

Generations

- one or two per year depending on climate.

Economic thresholds

Alberta

- nymphs 1, 2, 3 cause no economic damage
- nymphs 4, 5 at two to three per 90° sweep
- adults at two to three per 90° sweep.

Saskatchewan and Manitoba

- eight per 180° sweep.

Control

- treat with insecticide at economic threshold.

Pea aphid

Nymph and adult

- up to 3 mm in length
- light to dark green
- soft bodied and pear-shaped
- no spots on abdomen
- cornicles on abdomen
- walk slowly, as if on stilts
- young resemble adults
- either winged or wingless.

Damage

- suck juice from plants
- stunt growth
- cause premature drying
- carry diseases.

Evidence

- stunting, premature drying.

Generations

- many generations per year.

Economic thresholds

Alberta

- 150–200 per 90° sweep.

Saskatchewan and Manitoba

- 100–200 per 180° sweep when dryland crop is moisture-stressed, or until mid August.

Control

- treat with insecticide when economic threshold is reached.

Pea aphid



nymphs



adult

Western damsel bug



nymph



adult

Beneficial insects

Western damsel bug

Nymph

- up to 8 mm in length
- grayish
- resembles adult, but with developing wings.

Adult

- 8 mm in length
- grayish brown
- slender, sticklike
- pronounced beak
- long legs and antennae.

Benefit and prey

- feed on aphids, immature lygus and alfalfa plant bugs
- sometimes feed on small alfalfa weevil larvae.

Generations

- one per year.

Goldeneyed lacewing

Larva

- up to 9 mm in length
- usually mottled gray with yellowish gray markings
- spindle-shaped
- distinctive sickle-shaped mandibles (jaws) that pierce and suck juice from prey.

Adult

- up to 20 mm in length
- wingspan over 30 mm in length
- entirely green
- long antennae
- four delicate lacy wings
- pungent odor when caught.

Benefit and prey

- larvae feed on aphids, immature lygus and alfalfa plant bugs
- adults feed on honey dew, plant nectar, and pollen.

Generations

- one or two per year.

Goldeneyed lacewing



larva



adults

Lady beetles



larvae



adults

Lady beetles

Larvae

- up to 12 mm in length
- marked with blues, blacks, oranges
- somewhat flattened.

Adults

- 4–6 mm in length
- wings usually red, orange, or yellow with different arrangements of black spots.

Benefit and prey

- larvae are voracious predators of aphids (up to 25 per day), also consuming small lygus nymphs
- adults are voracious predators of aphids (up to 25 per day), must consume 120 aphids before egg-laying, and will consume three aphids for each egg laid; they deposit about 1500–1700 eggs during the summer.

Generations

- several per year, depending on species.

Minute pirate bug

Nymph

- up to 2 mm in length
- nymphs 1, 2, 3 yellowish to reddish orange
- nymphs 4, 5 black and white, resemble adult
- body somewhat flattened.

Adult

- 1.5–2 mm in length
- black and white
- head with predominant beak.

Benefit and prey

- feed on aphids, mites, and other small, soft-bodied insects.

Generations

- three or four per year.

Minute pirate bug



a, nymph 3; *b*, nymph 5; and *c*, adult

Syrphid fly



larva



adult

Syrphid flies

Larvae

- vary from brown to yellowish or green with white line down back (distinguishable from alfalfa weevil larvae by not having black head capsule)
- sluglike, rounded at rear, pointed at front.

Adults

- abdomen marked with yellow, black, or white bands
- fly like a helicopter, hovering over flowers
- resemble small bee or wasp.

Benefit and prey

- larvae are voracious predators of aphids.
- adults feed on honeydew, plant nectar, and pollen.

Generations

- several per year.

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